# Rhino Beam Tools - User Manual

## Introduction

*Rhino Beam Tools* is a plugin for Rhino 3D, designed to draw mechanical Beams and Nodes in context, then export them in a Beam calculation software. Currenttly, *RhinoBeamTools* is only compatible with ©Steel<sup>1</sup> (Editor: ®Bureau Veritas).

## **Plugin installation**

## Overview

The plugin installer can be downloaded at: https://www.tomkod.com/product/rhino-beam-tools/ A free trial is included, and yearly licenses can be purchased on the aforementioned page. *Rhino Beam Tools* works for Rhino 5<sup> $^{2}$ </sup>, Rhino 6<sup> $^{3}$ </sup>, and Rhino7<sup>4</sup>.

## Yak

Our plugins are also compatible with <u>Yak</u>, Rhino's new package manager <sup>5)</sup>, which is basically an application store for Rhino. You just need to call Rhino's command **\_PackageManager**:

Last update:

14:48 Package Manager × Online Installed tomkod AttributeAnalysis Name: v2.0.4-beta **AttributeAnalysis** Downloads: AttributeAnalysis is a tool designed to give you Author: Matthieu Arnold (TomKod) a fast Analysis of your rh... Installed: 2.0.4-beta ~ Version: v1.0.5-rc DrawUserTexts Date published: Jundi 14 décembre 2020 This plugin for Rhino6 brings several life changing https://www.tomkod.com/ tools for your 2D drawi... Url: product/attribute-analysis/

v1.0.3-beta

v1.1.0

v1.1.2

LightweightSurvey

conduct a vessel os full su...

MarineWeightSchedule

generate a bill of masses ...

between Rhino and spec...

RhinoBeamTools

✓ Include pre-releases

This plugin for Rhino allows your technicians to

The Marine Weight Schedule plugin for Rhino6 can

Rhino Beam Tools is a rhino plugin built as a bridge

Description:

attributes.

AttributeAnalysis is a tool designed to give you a

an attribute: all your objects will be colorized automatically and a color key table will be displayed. You will also be able to select objects by

fast Analysis of your rhino model attributes. Select

Close

Install

Uninstall

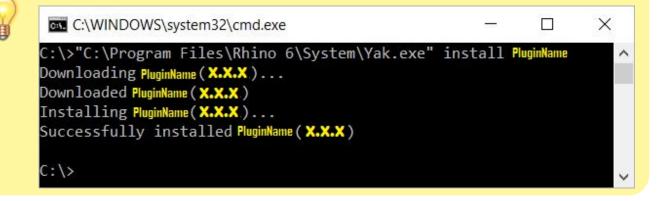
Help

upuale: 2021/02/08 start:plugins:rhinobeamtools:rbt-usermanual https://wiki.tomkod.com/doku.php?id=start:plugins:rhinobeamtools:rbt-usermanual&rev=1612792135

You can also install from the repository with the following command line:

"D:\Program Files\Rhino 6\System\Yak.exe" install 'PluginName'

If you add this in a batch file (\*.bat) at windows startup, it is probably the best way to keep all your plugins up-to-date 😉



## License activation

#### Prerequisites

The free evaluation can be used once per computer, and requires network access to www.license.tomkod.com The license activation requires network access to www.tomkod.com

Please check your firewall in case of failure.

#### Activation form

The activation window automatically shows up when the plugin is loading and a valid license or trial is not registered. If you want to see, change or remove your license while the plugin is already loaded, you can use the Rhino commands **PluginName\_License**.

Activation status is always visible on the upper right corner of the form, if the icon is green your plugin will be enabled:

Plugin Status	
Enabled - license is valid	$\sim$

#### Trial Tab

This first tab is dedicated to the trial requests. Your trial status is displayed, and the button is disabled if a trial is not available for your computer (Your trial has already been activated, or the server is unreachable)

TomKod license activation - Tab	ble 3.x	?	×
TomKod > Softwares for users, by users	Plugin Status Enabled - license is valid	Ø	)
Free Trial License Commercial Lice Computer ID:	nse Details		-
Reque	ist Free evaluation (*)		
Status: Accepted (End date	e: 21/12/2020)		

#### **Commercial Tab**

This tab's two main buttons let you Check-out (Activate) or Check-in (Desactivate) your license from

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our license server.

TomKod licens	e activation - Table	: 3.x		?	>
FomKod oftwares for use		Plugin Status Enabled - licens	e is valid	0	
Free Trial License	Commercial Licens	e Details			
Email	and an order	com.			1
Product key					ļ
Activ	rate (Check-Out)	- 3	Desactivate (C	heck-in)	
Status: Dis	abled				
Enable floa	ating licenses ( Affe	cts every TomKo	d plugins )		
Use a license ce	artificate				
	anti-in mathead for all	fline activation u	sing a certifica	te file	
Alter This can a	void network activa	tion issues, but th	e license won	't be floating.	

When the checkbox "Enable floating licenses" is checked, every TomKod's plugin will try to deactivate the license automatically when closing (Making it available for another of your computers)

Finally, a license certificate (\*.TkLic) can be selected at the bottom of this tab. It allows to activate a license offline, but the license won't be floating anymore. If you need one, contact us at https://www.tomkod.com/contact/

#### Toolbar

The toolbars for Rhino are always included in your plugins installation directory, or can be downloaded here.

You just have to drag/drop the file "Tomkod.rui" to a rhino window to install them.

## Generalities

#### Definitions

#### Nodes

Nodes are custom points with translations and rotation constraints defined on x, y & z axis. Every node in the model is identified by a unique number.

#### Beams

Beams are oriented lines located between two nodes <sup>6)</sup>. They are represented as an arrow, and have an optionnal angle option. Every beam in the model is identified by a unique number.

#### Sets

A set is a group of beams. It is mainly used to easily select beams together.

## Interface

#### Panel

*Rhino Beam Tools* comes with a user panel to interact with your Beams, Nodes and Sets. The panel display is refreshed in real time. If you select a beam or a node in the model, the panel is automatically displayed.

Nodes Beams Sets Display	Nodes Beams Sets Display	Nodes Beams Sets Display	Nodes Beams Sets Display
Selected Nodes list: 60, 50 DOFs Tenns./y - free Tenns./z - free Tenns./z - free Rot. /x - various Rot. /y - various Rot. /y - various Rot. /z - various	Selected Beams list 23 Definition First Node 61 Second Node 50 Angle 90.00	Sets of Beams Test1 Kest2	Beams display  Enable oriented preview  Enable local axes display  Nodes display  Enable annotations  Show Nodes Labels
O Fixed  Free O Spring O Forced	Value: 90 Z Local Vector: 0;-9;18 Reverse Beams	Create Set Rename Set Add beams to Set	Show node constraints Text height 11.000 Text offset -16
		Remove Beams from Set Remove Set	Fixed nodes Rotation-fixed nodes Translation-fixed nodes Free nodes
			Other nodes

#### Annotations

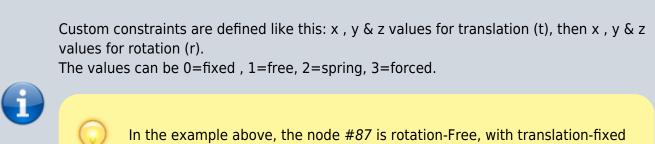
*Rhino Beam Tools* offer the possibility to display annotations in the model with the every node's settings:



The size, offset and color of these annotations can be edited. The annotations give the following information:

```
#{Node number} ({Constraints})
```

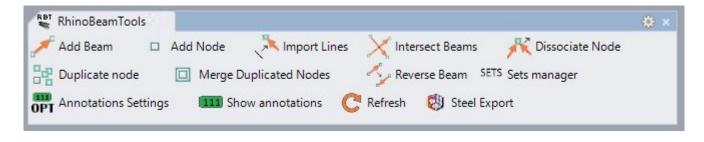
Constraints can be "Free", "TranslationFixed", "RotationFixed", or Custom.



on x, translation-spring on y, and translation-free on z

#### Toolbar

A toolbar is included in Tomkod's toolbar group, with buttons available for most commands:



## Commands

## **RBT\_About**

This command can be used only from the command line prompt. It displays the plugin's current revision and license status.

Commercial Name: Rhino Beam Tools 1.x Update Status: Rhino Beam Tools 1.x: Your current version (1.0.6.0) is an early release candidate. Latest stable vers Editor: TomKod Copyright: Copyright ©Ship-ST 2020 License status: License status unknown (Not implemented yet.) Computer ID: CHANGELOG:	ersion: 1.0.6
Computer ID: CHANGELOG:	
CHANGELOG:	
v1.0.6 (14-10-2020)	
Fixed: When a model contains Rhino Beams or nodes, any item selected would bring to front the RBT_Panel	
15 available commands:	
TK. SetLicenseMode	
RBT_About	
RBT AddBeam	
RBT_AddBeam RBT_AddNode	

## **RBT\_License**

This command can be used only from the command line prompt. It displays the plugin's activation form.

See license\_activation.

## **RBT\_AddNode**

Add Node This command adds a node to the model.

#### Walkthrough

- 1. Pick a location
- 2. The node is created without constraints (Free)
- 3. === Options ===

No option available.

### **RBT\_AddBeam**

Add Beam This command adds a beam to the model.

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#### Walkthrough

- 1. Pick two nodes
- 2. The beam is created from the first node to the second node.

#### Preselection

Preselection is allowed, but the nodes order will be random. If more than two nodes where preselected, the beam will randomly be created between two nodes.

#### Options

No option available.

## **RBT\_DissociateNode**

This command allows to separate two beams with a common node by duplicating the node.

#### Walkthrough

- 1. Select the beam that should be dissociated (The one that will be linked to a new node)
- 2. Select which node should be dissociated: StartNode or EndNode
- 3. Choose if the node constraints should be duplicated <sup>7</sup>). If *No* is selected, the new node will be unconstrained (Free).
- 4. Pick the new node location

#### Preselection

Preselection is allowed if only one beam is preselected

#### Options

- *StartNode* or *EndNode*
- Duplicate the node constraints

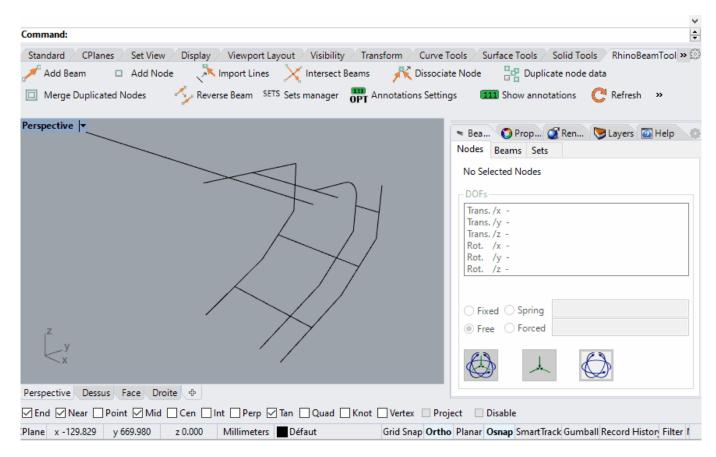
## **RBT** ImportLines

Import Lines

This command can convert lines and curves into beams and nodes.

#### Walkthrough

- 1. Select the line and curves that should be imported
- 2. Choose if the original lines should be removed
- 3. For each non linear curve, a segment count option is shown to split the curve in several lines. The current view is zoomed in and the current curve is highlighted.
- 4. Every beams and nodes are created, duplicated nodes are removed and intersecting beams are splitted.



#### Preselection

Preselection is allowed.

#### Options

• *Delete original lines* : Select wether or not the original curves should be removed from the model upon completion.

9/16

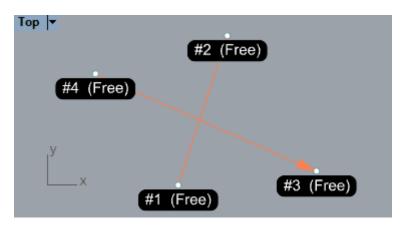
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## **RBT\_IntersectBeams**

Intersect Beams This commands check the whole model and adds node at beams intersections.

#### Walkthrough

Launch the command and that's it!



#### Options

No option available.

## **RBT\_MergeDuplicateNodes**

Merge Duplicated Nodes This command merge node with the same location.

#### Walkthrough

- 1. Set the tolerance (Default 0.001)
- 2. Every duplicated nodes are merged in the model

#### Options

• *Tolerance* : in model unit, maximum distance to consider two nodes duplicated.

## RBT\_Export



Exports your beams, nodes and sets to  $\ensuremath{\mathbb{C}}$  Steel<sup>8)</sup> or RDM7.

## Walkthrough

- 1. Launch the command
- Select a file path and extension to export the model to ©Steel3 (\*.stw\*), ©Steel4 (\*.steel\*), or RDM6-7 (\*.por\*)
- 3. The file is created, then RBT attempts to open it with windows default program for this extension.

#### Scripted mode

No Scripted Mode

#### Options

No option available.

## **RBT\_SetManager**

SETS Sets manager This command opens the Rhino Beam Tools panel on the Sets tab.

Nodes	Beams	Sets	Display
Sets o	f Beams		
Test1			
Test2			-
		Crea	te Set
		Rena	me Set
		Add bea	m <mark>s to Set</mark>
	Ren	nove Bea	ams from Set
		Remo	ove Set

#### Options

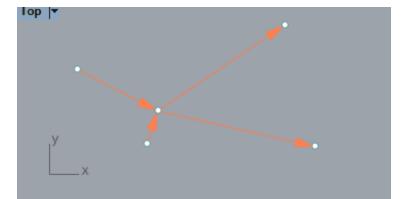
No option available.

## **RBT\_ReverseBeam**

Reverse Beam This command reverses the beam's first and second node.

#### Walkthrough

- 1. Select the beams
- 2. The beams nodes are swapped. The arrow orientation are refreshed as well as the node infos.



#### Preselection

Preselection is allowed, every selected beams will be reversed.

#### Options

No option available.

#### Alternative

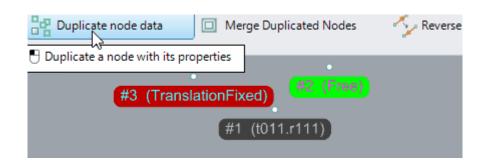
A "*Reverse beam*" button is available on the panel's Beams tab. It does the same thing but does not allow to reverse several beams at the same time.

## RBT\_DuplicateNodeData

Duplicate node data This command copies a node's constraints to another.

#### Walkthrough

- 1. Pick the original node to duplicate its constraints
- 2. Pick one or several nodes that need to be changed
- 3. The selected nodes are updated with the original node's constraints



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#### Preselection

Preselection is enabled if one and anly one node is preselected.

#### Options

No option available.

## **RBT\_ShowAnnotations**

111 Show annotations

#### Walkthrough

- 1. Launch the command.
- 2. If annotations were visible, they are hidden, if they were hidden they will be shown

OPT Annotations Settings	111 Show annotations 🛛 📿 Refresh
	#2 (RotationFixed) #4 (t011.r111
#1 (Free)	#3 (TranslationFixed)

#### Options

No option available.

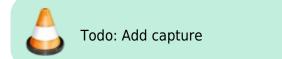
## **RBT\_DisplaySettings**



This command<sup>9)</sup> gives the possibility to change the annotations' display settings.

#### Walkthrough

- 1. Launch the command
- 2. RhinoBeamTools' panel<sup>10</sup> will be openned, with the *Display* tab selected.



## **RBT\_ImportSteel4File**

This command is a beta prototype. It might have unwanted behaviours and we will decline any responsability if it causes damages to your model. TomKod may or may not publish a proper version at a later date.

Attempts to import a *Steel (\*.steel)* project beams' and nodes' in your Rhino models.

#### Walkthrough

- 1. Launch the command
- 2. Select the file to import
- 3. Nodes are imported with their contraints
- 4. Beams are imported

## **RBT\_Refresh**

C Refresh

This command forces a display update:

- Overlapped nodes are merged
- Beam errors are detected
- Beam positions are fixed
- Rhino views are redrawn

Normally you don't need to use this command.

#### Options

No option available.

1)

v3 or v4 2) Rhino 5.12 or later 3) Rhino 6.15 or later 4) Tested up to Rhino 7.1 5) Rhino 6 or later only, with graphic user interface for Rhino7 only 6) More specifically, two node definition numbers 7) default value = true 8) ®Bureau Veritas' beam calculation software 9) Formerly named RBT\_AnnotationsSettings 10) See interface

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